WHAT IS CLAIMED IS:

1. A flexible waveguide capable of propagating and emitting light, comprising a flexible material having a surface and an end, wherein a first portion of the light is emitted through at least a portion of said surface of the flexible waveguide, and a second portion of the light is emitted through said end.

2. The waveguide of claim 1, wherein said flexible material is elastic.

3. The waveguide of claim 2, wherein said flexible material is characterized by an elasticity of at least 100 %.

4. The waveguide of claim 2, wherein said flexible material is characterized by tensile set value of less than about 5 %.

5. The waveguide of claims 3-5, wherein said flexible material is transparent.

6. The waveguide of any of claims 3-6, wherein said flexible material is clear.

7. The waveguide of any of claims 1-3, wherein said flexible material comprises a polymeric material.

8. The waveguide of claim 7, wherein said polymeric material comprises a rubbery material.

9. The waveguide of any of claims 1-8, wherein said flexible material is formed by dip-molding in a dipping medium.

10. The waveguide of claim 9, wherein said dipping medium comprises a hydrocarbon solvent in which a rubbery material is dissolved or dispersed.

11. The waveguide of any of claims 9-10, wherein said dipping medium comprises additives selected from the group consisting of cure accelerators, sensitizers, activators, emulsifying agents, cross-linking agents, plasticizers, antioxidants and reinforcing agents

12. The waveguide of any of claims 7-11, wherein said flexible material has a predetermined level of cross-linking.

13. The waveguide of claim 12, wherein said cross-linking is physical cross-linking.

14. The waveguide of claim 12, wherein said cross-linking is chemical cross-linking.

15. The waveguide of claim 12, wherein said cross-linking is a combination of physical cross-linking and chemical cross-linking.

16. The waveguide of any of claims 12, 13 or 15, wherein said flexible material is cross-linked via a radiation selected from the group consisting of electron beam radiation and electromagnetic.

17. The waveguide of any of claims 1-16, wherein said flexible material is biocompatible.

18. The waveguide of any of claims 1-17, wherein a thickness of the waveguide is selected so that the light propagates at a predetermined propagation angle.

19. The waveguide of any of claims 1-18, wherein said flexible material comprises a dielectric material, and further wherein a reflection coefficient of said dielectric material is selected so as to allow propagation of polarized light through the waveguide, and emission of said polarized light through said surface of the waveguide.

20. The waveguide of any of claims 1-18, wherein said flexible material comprises a metallic material, and further wherein a reflection coefficient of said metallic material is selected so as to allow propagation of polarized light through the waveguide, and emission of said polarized light through said surface of the waveguide.

21. The waveguide of any of claims 1-20, wherein said flexible material is a multilayered material.

22. The waveguide of any of claims 1-21, wherein said flexible material comprises a first layer having a first refractive index, and a second layer being in contact with said first layer and having a second refractive index being larger that said first refractive index.

23. The waveguide of claim 22, wherein at least one of: a thickness of said first layer, a thickness of said second layer, said first refractive index and said second refractive index, is selected so that the light propagates at a predetermined propagation angle.

24. The waveguide of claim 22, wherein said propagation angle is from about 5 degrees to about 30 degrees.

25. The waveguide of any of claims 22-24, wherein said second layer comprises polyisoprene.

26. The waveguide of any of claims 22-25, wherein said first layer comprises silicone.

27. The waveguide of any of claims 22-24, wherein said flexible material further comprises a third layer for being in contact with said second layer and having a third refractive index being smaller than said second refractive index.

28. The waveguide of claim 27, wherein said third refractive index equals said first refractive index.

29. The waveguide of any of claims 27-28, wherein said third layer comprises silicone.

30. The waveguide of any of claims 22-30, wherein said at least a portion of said surface comprises a predetermined pattern.

31. The waveguide of any of claims 22-30, wherein at least one of said first and said second layers comprises at least one additional component designed and configured so as to allow said emission of the light through said at least a portion of said surface.

32. The waveguide of claim 31, wherein said at least one additional component is capable of producing different optical responses to different wavelengths of the light.

33. The waveguide of claim 32, wherein said different optical responses comprises different emission angles.

34. The waveguide any of claims 32-33, wherein said different optical responses comprises different emission wavelengths.

35. The waveguide of any of claims 27-33, wherein said third layer comprises at least one additional component designed and configured so as to allow said emission of the light through said at least a portion of said surface.

36. The waveguide of any of claims 33-35, wherein said at least one additional component comprises at least one impurity, present in said second layer and being capable of emitting said first portion of the light through said at least a portion of said surface.

37. The waveguide of any of claim 36, wherein said at least one impurity comprises a plurality of particles capable of scattering said first portion of the light to thereby emit said first portion through said at least a portion of said surface.

38. The waveguide of claim 37, wherein a size of said plurality of particles is selected so as to selectively scatter a predetermined range of wavelengths of the light.

39. The waveguide of any of claims 36-38, wherein a concentration and distribution of said at least one impurity is selected such that said first portion of said light is emitted from a predetermined region of said surface area.

40. The waveguide of claim 38, wherein said predetermined region of said surface area comprises a predetermined pattern.

41. The waveguide of any of claims 36-37, wherein said at least one impurity comprises a plurality of beads each having a predetermined combination of color-components being selected from the group consisting of fluorochromes, chromogenes, quantum dots, nanocrystals, nanoprisms, nanobarcodes, scattering metallic objects, resonance light scattering objects and solid prisms.

42. The waveguide of claim 41, wherein beads having different responses to light are distributed in different regions of said second layer, thereby forming different patterns of different responses to light at said different regions.

43. The waveguide of any of claims 33-35, wherein said at least one additional component comprises at least one diffractive optical element, said at least one diffractive optical element being for diffracting said first portion of the light to thereby emit said first portion through said at least a portion of said surface.

44. The waveguide of claim 43, wherein said at least one diffractive optical element is selected from the group consisting of a non-smooth surface of said second layer, a mini-prism and a diffraction grating.

45. The waveguide of any of claims 43-44, wherein a location of said at least one diffractive optical element is selected such that said first portion of said light is emitted from a predetermined region of said surface area.

46. The waveguide of claim 45, wherein said predetermined region of said surface area comprises a predetermined pattern.

47. The waveguide of any of claims 44-46, wherein said at least one diffractive optical element is designed and constructed to selectively diffract a predetermined range of wavelengths of the light.

48. The waveguide of any of claims 33-35, wherein said at least one additional component comprises at least one region of high refractive index, present in said first layer

and/or in said third layer, said high refractive index being selected such that said portion of said light is emitted through said at least a portion of said surface.

49. The waveguide of claim 48, wherein said high refractive index is larger than said second refractive index.

50. The waveguide of any of claims 48-49, wherein a location of at least one region of said high refractive index is selected such that said first portion of said light is emitted from a predetermined region of said surface area.

51. The waveguide of claim 50, wherein said predetermined region of said surface area comprises a predetermined pattern.

52. The waveguide of any of claims 1-51, wherein said flexible material comprises a dielectric material characterized by a temperature dependent electromagnetic properties.

53. The waveguide of any of claims 1-52, wherein the light is polarized.

54. The waveguide of any of claims 1-52, wherein the light is unpolarized.

55. The waveguide of any of claims 1-54, wherein the light comprises a plurality of wavelengths.

56. The waveguide of any of claims 1-55, wherein the light comprises at least one wavelength in the visible spectrum.

57. The waveguide of any of claims 1-55, wherein the light comprises at least one wavelength in the non-visible spectra.

58. The waveguide of any of claims 1-55, wherein the light comprises at least one wavelength in the infrared spectrum.

59. The waveguide of any of claims 1-55, wherein the light comprises at least one wavelength in the ultraviolet spectrum.

60. A flexible waveguide capable of propagating and emitting light, comprising a flexible material having a surface and an end, wherein light propagates at a plurality of directions through said flexible material, such that a first portion of the light is emitted through at least a portion of said surface of the flexible waveguide, and a second portion of the light is emitted through said end.

61. A flexible waveguide capable of propagating and emitting light, comprising a flexible material having a surface, said flexible material being characterized in that when light enters said flexible material, a first portion of said light propagates through said flexible material and a second portion of said light is emitted from a surface of said flexible material in a direction other than tangential thereto.

62. A flexible waveguide capable of propagating and emitting light, comprising a flexible material having a surface and an end, the flexible waveguide comprising at least one impurity capable of scattering a first portion of the light so that said first portion of the light is emitted through at least a portion of said surface of the flexible waveguide, while a second portion of the light is emitted through said end.

63. A flexible optical device, comprising:

(a) an optical coupler; and

(b) a flexible material having a surface and an end, said flexible material being characterized by a numerical aperture;

wherein said optical coupler is capable of focusing light to impinge on said flexible material at an impinging angle satisfying said numerical aperture, and said flexible material is characterized in that a first portion of said light is emitted through at least a portion of said surface, and a second portion of said light is emitted through said end.

64. A method of providing illumination, the method comprising:

providing a flexible material having a surface and an end;

propagating light through said flexible material;

emitting a first portion of said light through at least a portion of said surface; and

emitting a second portion of said light through said end.

65. The method of claim 64, wherein said emission of said first portion of the light is by at least one impurity, present in said flexible material and being capable of emitting said first portion of the light through said at least a portion of said surface.

66. The method of any of claims 64-65, further comprising sensing an ambient temperature and emitting said first and/or said second portion based on said ambient temperature.

67. The method of any of claims 64-65, wherein said emission of said first portion of the light comprises emitting different wavelengths of light from different regions of said surface, thereby providing a wavelength dependent visual signal.

68. A clothing device for providing illumination, comprising:

(a) a clothing; and

(b) a light source for providing light, wherein said light source is physically coupled to said clothing, said light source featuring a flexible waveguide.

69. The device of claim 68, wherein at least a portion of said clothing comprises a flexible material having a surface and an end, characterized in that a first portion of the light is emitted through at least a portion of said surface, and a second portion of the light is emitted through said end.

70. The device of any of claims 68-69, further comprising an optical coupler, capable of focusing the light to impinge on said flexible material at an impinging angle satisfying a numerical aperture of said flexible material.

71. The device of any of claims 68-70, further comprising at least one optical fiber for transmitting said light from said light source to said clothing.

72. The device of any of claims 68-71, further comprising at least one optical fiber connected to said clothing for transmitting said light within said clothing.

73. The device of any of claims 68-72, further comprising a light gradient transmission device connected to said clothing for transmitting said light within said clothing, wherein said light gradient transmission device comprises a plurality of impurities arranged such that internal reflection of said light is minimized.

74. The device of any of claims 68-73, further comprising a plurality of light transmission points for providing illumination, said light transmission points being connected to said clothing, wherein said light transmitted through said clothing is emitted at said light transmission points.

75. The device of any of claims 68-74, wherein said clothing is a glove.

76. The device of claim 75, wherein at least a majority of said light transmission points is located in at least one fingertip of said glove.

77. The device of claim 75, wherein at least a majority of said light transmission points is located in at least a palm of said glove.

78. A medical device for providing illumination, comprising:

(a) a medically useful implement having at least one additional function other than providing illumination; and

(b) a light source for providing light of any single or multiple wavelengths, said light source featuring a flexible waveguide and being physically coupled to said medically useful implement.

79. The device of claim 78, wherein said medically useful implement comprises at least one of a clothing, a cannula, a blanket, an absorbent pad, and a surgical clamp.

80. An optical coupler, comprising a converging optical element connected to a waveguide characterized by a numerical aperture, said converging optical element being capable of focusing a light beam to impinge on said waveguide at an impinging angle satisfying said numerical aperture, thereby propagating said light beam through said waveguide.

81. The optical coupler of claim 80, wherein said converging optical element is a converging lens.

82. The optical coupler of claim 81, wherein said converging lens is a microlens.

83. The optical coupler of any of claims 80-82, wherein said converging optical element is formed on or integrated with said waveguide.

84. The optical coupler of any of claims 80-82, wherein said converging optical element is a spherical light transmissive substrate.

85. The optical coupler of any of claims 80-82, further comprising at least one optical fiber for guiding at least a portion of said light beam to said converging optical element.

86. The optical coupler of any of claims 80-85, further comprising a shutter, for blocking a first portion of said light beam, said first portion corresponding to impinging angles other than impinging angles satisfying said numerical aperture.

87. The optical coupler of any of claims 80-82, wherein said converging optical element is a reflector, capable of redirecting at least a portion of said light beam to impinge on said waveguide at an impinging angle satisfying said numerical aperture.

88. The optical coupler of any of claims 80-87, wherein said waveguide is selected from the group consisting of an optical fiber, a fiber bundle.

89. The optical coupler of claim 88, wherein said waveguide comprises a flexible material having a surface and an end, said flexible material being capable of emitting a first portion of said light beam through at least a portion of said surface, and a second portion of said light beam through at least a portion of said end.